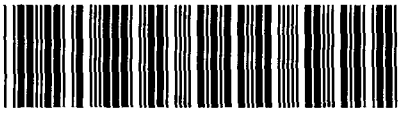

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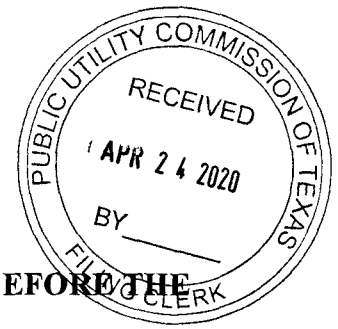

PUC PROJECT NO. 46304

OVERSIGHT PROCEEDING REGARDING ERCOT MATTERS ARISING OUT OF DOCKET NO. 45624 (APPLICATION OF THE CITY OF GARLAND TO AMEND A CERTIFICATE OF CONVENIENCE AND NECESSITY FOR THE RUSK TO PANOLA DOUBLE-CIRCUIT 345-KV TRANSMISSION LINE IN RUSK AND PANOLA COUNTIES)	§	**BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS**

ELECTRIC RELIABILITY COUNCIL OF TEXAS'S SEVENTH STATUS UPDATE

Electric Reliability Council of Texas, Inc. ("ERCOT") submits this status update pursuant to Paragraph 13 of the Commission's Revised Order Creating and Scoping Project, signed on May 23, 2017 ("Revised Order"), which requires ERCOT to "periodically update the Commission regarding its progress in completing" the tasks set forth in the Revised Order. These tasks arise from the Commission's May 23, 2017, Order on Rehearing in Commission Docket 45624, which imposes certain conditions on the interconnection of the DC tie project proposed by Southern Cross Transmission, LLC ("Southern Cross"). ERCOT filed its last status update in this matter on November 22, 2019.

ERCOT has made progress in a number of areas since the last status update. With respect to directive 7, regarding economic dispatch of DC ties and congestion management, ERCOT drafted a whitepaper setting forth its determinations that: (1) the existing DC tie scheduling interface does not allow for economic dispatch of DC ties, and it would be prohibitively complicated and expensive to develop a system to enable economic dispatch; and (2) while ERCOT expects it would have reliability concerns with a Congestion Management Plan (CMP) or Remedial Action Scheme (RAS) to address potential congestion impacted by the Southern Cross

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DC tie due to its size, evaluation of any proposed CMP or RAS is fact-specific and could only be properly evaluated if and when proposed by an entity at a later date. In light of these determinations, no revisions to ERCOT Protocols or Market Guides are necessary in order to resolve directive 7. The ERCOT Board approved ERCOT's determinations with respect to directive 7 at its February 11, 2020, meeting. *See* Attachment A, memo to ERCOT Board, whitepaper, and signed resolution approving directive 7 determination. Accordingly, ERCOT considers that its work on directive 7 is complete, unless otherwise advised by the Commission.

ERCOT's work is ongoing on other directives. With respect to directive 3, regarding ramp rate restrictions, ERCOT has proposed Nodal Protocol Revision Request (NPRR) 999, DC Tie Ramp Restrictions.[1] This NPRR proposes revising the Protocols to clarify that, in cases where ERCOT determines that system conditions show insufficient ramp capability to meet the sum of all DC ties' scheduled ramp, ERCOT may either (1) curtail DC tie schedules; or (2) require DC Tie Operators to resubmit e-Tags with an adjusted ramp duration. This NPRR is currently pending and will be discussed at an upcoming Protocol Revisions Subcommittee (PRS) meeting.[2]

With respect to directive 9 regarding ancillary services, ERCOT continues to discuss with Southern Cross possible Protocol revisions that would limit DC tie flows in lieu of requiring additional ancillary services to be procured. Additionally, ERCOT expects to have further discussions with stakeholders in the coming months about next steps on directive 6, regarding transmission upgrades, and directive 8, regarding voltage support service. Finally, stakeholder discussions have not yet begun with respect to directives 2, 11, and 12, because those discussions require completion of work on other directives.

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[1] See http://www.ercot.com/mktrules/issues/NPRR999.

[2] Due to current, temporary restrictions on in-person ERCOT stakeholder meetings, PRS has been deferring voting on new, non-urgent NPRRs, such as NPRR999.

ERCOT has revised the expected timelines for resolution of the remaining directives in light of recent activity. An updated timeline is attached to this filing as Attachment B.

In summary, ERCOT staff, Southern Cross, and various ERCOT stakeholder groups have been working diligently on the issues raised in the Commission's directives, and ERCOT expects continued progress on these directives.

ERCOT would be pleased to provide any additional information the Commission may request regarding the status of this project.

Respectfully,

/s/ Erika M. Kane

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ATTORNEYS FOR ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.

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Date: February 4, 2020
To: Board of Directors
From: Matt Mereness, Director of Compliance
Subject: ERCOT Recommendations to PUC Project No. 46304, Oversight Proceeding Regarding ERCOT Matters Arising Out of PUC Docket No. 45624 Relating to DC Tie Project Proposed by Southern Cross Transmission, LLC, (Southern Cross) Directive 7 – ERCOT Determination Regarding Congestion Management

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: February 11, 2020
Item No.: 11

Issue:
Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should vote to accept ERCOT staff's determination that: (1) DC Ties cannot be economically dispatched using the existing DC Tie scheduling interface, and developing the appropriate systems to enable economic dispatch between ERCOT and one or more other systems would be prohibitively complicated and expensive; (2) while ERCOT would likely have reliability concerns with any Constraint Management Plan (CMP) or Remedial Action Scheme (RAS) that might be used to manage congestion caused by the Southern Cross DC Tie, ERCOT's consideration of any CMP or RAS is fact-specific, such that ERCOT will evaluate any future CMP or RAS developed by ERCOT or properly proposed by other entities at the appropriate time; and (3) no revisions to ERCOT Protocols or Guides are needed to address this Directive.

Background/History:
In PUC Project No. 45624, the Public Utility Commission of Texas (PUCT) issued an Order that approved the City of Garland's application for a certificate of convenience and necessity (CCN) to build a new 38-mile-long, 345kV transmission line connecting the proposed 2,000 MW Southern Cross DC Tie to ERCOT. In the Order, the PUCT also imposed certain conditions on the interconnection of the Southern Cross DC Tie. The PUCT then opened PUC Project No. 46304, and on May 23, 2017, it issued a Revised Order in that project that directed ERCOT to complete a number of tasks set forth in 14 different Directives.

The Directives require ERCOT to study various issues related to the new DC Tie and make determinations as to whether any actions need to be taken by ERCOT in order to accommodate the new DC Tie. ERCOT staff has been working with stakeholders and Southern Cross since mid-2017 to complete the tasks set forth in the Directives. Discussions on the Directives have been taking place in the relevant working groups and subcommittees of the Technical Advisory Committee (TAC) to assist ERCOT staff in reaching resolutions on the discrete issues raised in each Directive, and these discussions are expected to continue until all of the issues raised in the Directives are

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fully resolved.

For each Directive, ERCOT staff will propose one or more determinations for stakeholder review and comment, along with any NPRRs needed to address the Directive, and will seek stakeholder endorsement of the determination at relevant working groups, subcommittees, TAC, and the Board.

This particular determination concerns Directive 7, which requires that ERCOT:

> "...shall (a) study and determine whether some or all DC ties should be economically dispatched or whether implementing a congestion-management plan or special protection scheme would more reliably and cost-effectively manage congestion caused by DC tie flows, (b) implement any necessary revisions to its protocols, guides, standards, and systems as appropriate, and (c) certify to the Commission when it has completed these actions."

Discussions with stakeholders regarding this issue occurred at the following meetings: Congestion Management Working Group (CMWG) on 5/6/2019, 9/30/2019, and 12/16/2019; Wholesale Market Subcommittee (WMS) on 1/8/2020; and TAC on 1/29/2020. ERCOT staff prepared a whitepaper (link) setting forth its determination and considerations relevant to that resolution, which was presented for discussion at these meetings.

Although ERCOT's discussions with stakeholders with respect to Directive 7 identified concerns related to congestion management associated with a DC Tie of the size proposed by Southern Cross, ERCOT staff determined that existing systems and processes are sufficient to manage congestion associated with DC Ties. ERCOT reviewed the possibility of integrating DC Ties into its Security-Constrained Economic Dispatch (SCED) engine and determined this would be infeasible due to the cost and the nature and degree of coordination that would be required with system operators at the other end of the DC Ties. Further, ERCOT staff determined that the use of a Constraint Management Plan (CMP) or Reliability Action Scheme (RAS) (formerly referred to as "Congestion Management Plan" and a "Special Protection Scheme," respectively, as used in the PUCT's Order in Project No. 46304) to address congestion related to the Southern Cross DC Tie would likely raise reliability concerns; however, ERCOT remains open to reviewing a possible CMP or RAS in the future should one be proposed.

In light of the foregoing, ERCOT staff determined that no further revisions to ERCOT Protocols or Guides are necessary in order to effectuate ERCOT's determinations regarding reliable and cost-effective congestion management following the interconnection of the Southern Cross DC Tie. ERCOT staff's recommendation was endorsed by TAC on January 29, 2020, with eight abstentions.

Key Factors Influencing Issue:

- Although integrating DC Ties into ERCOT's SCED engine would allow for more efficient scheduling of imports and exports over the DC Ties, ERCOT has determined

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that this is not feasible. Such an effort would require the complex and costly development of a joint dispatch mechanism with system operators in other affected regions, a binding commitment that would limit ERCOT's authority over one aspect of its market design, and may not be subject to the sole authority of the PUCT. Further, integrating DC Ties into SCED would likely involve high costs of implementation that would be borne by consumers, and it is not certain that these costs would result in a clear public benefit.

- Although a CMP or RAS might enable greater transfers over the DC Ties under certain conditions, ERCOT is required to consider the potential reliability impacts of such a proposal. Based on information currently available to ERCOT, ERCOT believes that it would likely have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size. Nevertheless, going forward, ERCOT will evaluate any properly proposed CMP or RAS in light of the relevant facts and circumstances and in accordance with the ERCOT rules and policies in effect at the time of consideration.

- Existing mechanisms in ERCOT can be used to manage congestion due to flows over the DC Ties:
  - Price signals provide a strong incentive to affected QSEs to adjust e-Tags to mitigate the congestion;
  - ERCOT can use Reliability Unit Commitment (RUC) to bring available dispatchable generation on line to alleviate the congestion; and
  - ERCOT can issue a DC Tie Curtailment Notice and curtail the import or export of electric energy over the DC Tie to the extent necessary to operate the system within its limits.

Conclusion/Recommendation:

ERCOT has determined that DC Ties cannot be economically dispatched using the existing DC Tie scheduling interface and that developing the appropriate systems to enable economic dispatch between ERCOT and one or more other systems would be prohibitively complicated and expensive. Further, while ERCOT would likely have reliability concerns with any CMP or RAS that might be used to manage congestion caused by the Southern Cross DC Tie, ERCOT's consideration of any CMP or RAS is fact-specific, such that ERCOT will evaluate any future CMP or RAS developed by ERCOT or properly proposed by other entities at the appropriate time. Consequently, ERCOT has not identified any required revisions to ERCOT Protocols or Guides that are needed at this time to more reliably and cost-effectively manage congestion caused by DC Tie flows. ERCOT staff recommends that the Board accept ERCOT staff's determination that no further action is necessary at this time.

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PUC Project No. 46304
Oversight Relating to the Southern Cross Transmission (SCT) DC Tie
Congestion Management Considerations (Directive 7)

Date: 1/29/2020

Market stakeholder input: CMWG 05/06/2019 , 09/30/2019; 12/16/2019; WMS 1/8/2020

CMWG action: Consensus to endorse ERCOT'sSouthern Cross Transmission whitepaper regarding Directive #7, Congestion Management Considerations on 12/16/2019.

WMS action: After making desktop edits Determination language, WMS endorsed ERCOT's Southern Cross Transmission whitepaper regarding Directive #7, Congestion Management Considerations on 1/8/2020.

Directive # 7 – Congestion Management	**ERCOT shall (a) study and determine whether some or all DC ties should be economically dispatched or whether implementing a congestion-management plan or special protection scheme would more reliably and cost-effectively manage congestion caused by DC tie flows, (b) implement any necessary revisions to its protocols, guides, standards, and systems as appropriate, and (c) certify to the Commission when it has completed these actions.**

Determination:

(a) ERCOT has determined that DC Ties cannot be economically dispatched using the existing DC Tie scheduling interface and that developing the appropriate systems to enable economic dispatch between ERCOT and one or more other systems would be prohibitively complicated and expensive. ERCOT's consideration of any Constraint Management Plan (CMP) or Remedial Action Scheme (RAS) is fact-specific, and ERCOT will evaluate any CMP or RAS developed by ERCOT or properly proposed by other entities at the appropriate time. Based on information currently available to ERCOT, ERCOT expects that it would have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size;

(b) ERCOT has not identified any required revisions to ERCOT Protocols or Guides as a result of this Directive.

Reasons for determination:

Determination of whether some or all DC Ties should be economically dispatched

Although integrating DC Ties into ERCOT's security-constrained economic dispatch (SCED) engine would allow for more efficient scheduling of imports and exports over the DC Ties, ERCOT has determined that this is ultimately not feasible.

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Imports and exports over the DC Ties connecting ERCOT with the Southwest Power Pool (SPP) and Mexico are currently scheduled over an electronic interface operated by Open Access Technology International, Inc. (OATI) in accordance with design specifications and standards established by the North American Energy Standards Board (NAESB). This interface requires the use of "electronic tags," or "e-Tags," each of which proposes a specified import or export quantity on a given DC Tie for a specified Operating Hour and is subject to approval or rejection (or curtailment) by each affected Balancing Authority and other entities. E-Tags may be submitted as far out as days in advance of the Operating Hour, or as close as minutes before the Operating Hour.

The use of static, pre-determined e-Tags for scheduling DC Tie flows is incompatible with economic dispatch of the DC Ties, which presumably would determine the appropriate direction and magnitude of DC Tie flows every five minutes (or other established interval) based on offers and bids for the injection or withdrawal of energy at both ends of the DC Tie and subject to constraints in each of the impacted systems, whereas the current e-Tag submission and approval process determines flows without regard to price based on submissions that may occur well in advance of the Operating Hour.

The OATI interface for submitting e-Tags could conceivably be modified to allow the ERCOT DC Ties to be dynamically scheduled, as is the case for several other regional interties in North America. Dynamic scheduling allows the actual flow value to vary in real time from the scheduled value and also allows for the ex-post reconciliation of the actual flow value with the scheduled flow value. However, dynamic scheduling does not equate to economic dispatch; a separate economic dispatch system would need to be created and implemented independent of the electronic e-Tag submission interface.

For several reasons, ERCOT is not inclined to pursue the development of systems to economically dispatch the DC Ties between ERCOT and other control areas. Such an effort would require ERCOT to coordinate the development of a joint dispatch mechanism with the affected system operator(s) at the other end of each affected DC Tie. This would be a highly complicated undertaking, as the mechanism would have to be integrated with the dispatch software in each affected region. Such a mechanism would almost certainly require ERCOT and each other affected system operator to enter into a binding commitment to use the dispatch mechanism and to accept the output in system dispatch, which would limit ERCOT's authority over one aspect of its market design. And the enforcement of this commitment may not be subject to the sole jurisdiction of the Public Utility Commission of Texas, unlike all other matters of ERCOT market design. Developing these systems would also presumably require ERCOT to incur substantial cost because of the impact on the core systems controlling economic dispatch, and at least in the case of the existing DC Ties, would require consumers to fund this cost without a clear corresponding public benefit. For these reasons, ERCOT has determined that incorporating DC Ties into SCED is not presently feasible.

Determination of whether implementing a Constraint Management Plan (CMP) or Remedial Action Scheme (RAS)[1] could reliably and cost-effectively manage congestion caused by DC Tie flows

As more fully described in Section 11 of the Nodal Operating Guide, Constraint Management Plans (CMP) (formerly known as "Congestion Management Plans") and Remedial Action Schemes (RAS) (formerly known as "Special Protection Systems")—are devices or schemes that ERCOT, in its discretion,

[1] The Directive uses the terms "Congestion Mangement Plan" and "Special Protection Scheme" but the equivalent current terms are "Constraint Management Plan" and "Remedial Action Scheme," respectively.

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may employ when it anticipates that SCED alone may not be able to ensure secure operation of the transmission system under certain specific circumstances, or where operation under N-1-secure conditions may not allow for full utilization of the ERCOT transmission system.

In some cases, imports and exports over DC Ties can impact congestion or stability conditions on the ERCOT System. In those instances, it is conceivable that ERCOT could devise or approve a CMP or RAS that would allow for use of the DC Tie above the level at which it would be constrained under normal N-1 operations. However, such a CMP or RAS introduces reliability risk. A RAS, for example, depends on the reliable operation of a set of automatic actions that are designed to eliminate an overload or other security violation in the event of a contingency. If that scheme does not work as planned due to some mechanical failure or other issue, transmission facilities could be damaged and may need to be taken out of service for extended periods of time, and ERCOT operators could be forced to take emergency actions, including shedding load, in an effort to avoid a wider system problem.

Thus, while a CMP or RAS might enable greater transfers over the DC Ties under certain conditions in which the import or export flow would otherwise be constrained, ERCOT would also be required to consider the potential reliability impacts of such a proposal. Based on information currently available to ERCOT, ERCOT expects that it would have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size. ERCOT's evaluation of a proposed CMP or RAS is necessarily fact-specific; it depends on the specific set of actions proposed, the system topology impacted, and the reliability risks attendant to the proposal, among other things. For this reason, ERCOT cannot categorically approve or reject a CMP or RAS at this time; ERCOT must evaluate any properly proposed CMP or RAS in light of the relevant facts and circumstances and in accordance with the ERCOT rules and policies in effect at the time of consideration.

Other means of addressing congestion on DC Ties

While ERCOT has concluded that economic dispatch of DC Ties is not feasible, and while ERCOT has not identified any particular CMP or RAS that should be approved to address DC Tie flows, this does not mean that no mechanism exists to manage congestion due to flows over the DC Ties. QSEs scheduling imports or exports will be impacted by prices determined by SCED, and when an import or export contributes to congestion on a binding transmission constraint, the SCED-determined price will be negatively impacted. These price signals provide a strong incentive to each affected QSE to adjust its e-Tags to mitigate the congestion. At the same time, SCED will adjust its dispatch of Generation Resources to mitigate this congestion.

To the extent the QSE does not take timely actions in response to price, or to the extent SCED does not have sufficient on-line, dispatchable generation to alleviate the congestion caused in part by the DC Tie import or export, ERCOT can use Reliability Unit Commitment (RUC) to bring any available dispatchable generation on line to alleviate the congestion. If RUC is not (or would not be) sufficient to resolve the issue, and no approved CMP is available to resolve the issue, ERCOT can issue a DC Tie Curtailment Notice and curtail the import or export of the DC Tie to the extent necessary to operate the system within its limits.

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ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, the Public Utility Commission of Texas (PUCT) issued a Revised Order (Revised Order) on May 23, 2017, in PUCT Project No. 46304 that contains 14 Directives requiring Electric Reliability Council of Texas, Inc. (ERCOT) to study certain issues related to the proposed Southern Cross Transmission, LLC (Southern Cross) DC Tie and make determinations as to whether certain actions must be taken by ERCOT in order to accommodate the Southern Cross DC Tie;

WHEREAS, Directive 7 of the Revised Order requires that ERCOT study and determine whether some or all DC Ties should be economically dispatched or whether implementing a congestion-management plan or special protection scheme—now referred to as "Constraint Management Plan" (CMP) and "Remedial Action Scheme" (RAS), respectively—would more reliably and cost-effectively manage congestion caused by DC Tie flows, implement any necessary revisions to its protocols, guides, standards, and systems as appropriate, and certify to the Commission when it has completed these actions;

WHEREAS, ERCOT staff, after discussions with stakeholders, determined that developing systems to enable economic dispatch of DC Ties would be prohibitively complicated and expensive and that, while ERCOT would likely have reliability concerns with any CMP or RAS used to manage congestion on the Southern Cross DC Tie, ERCOT's consideration of any CMP or RAS is fact-specific, such that ERCOT will evaluate any CMP or RAS proposed in the future at that time; and

WHEREAS, after due consideration of the alternatives, the Board deems it desirable and in the best interest of ERCOT to accept ERCOT staff's determination;

THEREFORE, BE IT RESOLVED, that the Board hereby accepts ERCOT staff's determination that:

- DC Ties cannot be economically dispatched using the existing DC Tie scheduling interface and developing the appropriate systems to enable economic dispatch between ERCOT and one or more other systems would be prohibitively complicated and expensive;
- ERCOT's consideration of any CMP or RAS is fact-specific, and ERCOT will evaluate any CMP or RAS developed by ERCOT or properly proposed by other entities at the appropriate time;
- Based on information currently available to ERCOT, ERCOT expects that it would have reliability concerns with a CMP or RAS solution to address potential congestion impacted by the Southern Cross DC Tie due to its size; and
- No revisions to ERCOT Protocols or Guides are needed at this time to more reliably and cost-effectively manage congestion caused by DC Tie flows.

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CORPORATE SECRETARY'S CERTIFICATE

I, Vickie G. Leady, Assistant Corporate Secretary of ERCOT, do hereby certify that, at its February 11, 2020, meeting, the ERCOT Board passed a motion approving the above Resolution by unanimous voice vote with no exceptions.

IN WITNESS WHEREOF, I have hereunto set my hand this 24th day of February 2020.

Vickie G. Leady
Assistant Corporate Secretary

ATTACHMENT B

ERCOT - Southern Cross Transmission (SCT)
Project No. 46304

Directives	Status	Anticipated Start Date*	Target Completion Date †
1. ERCOT shall (a) determine the appropriate market participation category for Southern Cross Transmission LLC and for any other entity associated with the Southern Cross DC tie for which a new market participant category may be appropriate (creating new ones if necessary), (b) implement the modifications to the standard-form market-participant agreement and its protocols, bylaws, operating guides, and systems required for Southern Cross Transmission's participation and any other entity's participation, and (c) determine the appropriate market segment for Southern Cross Transmission and any other entity.	Complete • Determination of Market Participant category for SCT. • Revisions to relevant ERCOT Protocols and Market Guides. Tabled upon request of SCT • Determination of SCT market segment. Not Started • System changes to implement Protocol/Market Guide revisions.	In Progress	TBD
2. ERCOT shall execute a coordination agreement or agreements with any necessary independent system operator, regional transmission organization, or reliability coordinator on the eastern end of the Southern Cross line. ERCOT shall consult Southern Cross Transmission as needed during negotiations of such agreement(s) for technical input and guidance.	Not Started	Early 2021	Q4 2021
3. ERCOT shall determine what ramp rate restrictions, if any, will be necessary to accommodate the interconnection of the Southern Cross DC tie and shall implement those restrictions and shall certify to the Commission when it has completed these actions.	In Progress	In Progress	Q4 2020

* Anticipated start date for internal discussions. Start dates listed only for directives were work has not yet begun.
† Subject to change – ERCOT, Inc. will provide periodic updates to schedule.

ATTACHMENT B

Directives	Status	Anticipated Start Date*	Target Completion Date †
4. ERCOT shall develop and implement a methodology to coordinate reliably and cost-effectively outages following the interconnection of the Southern Cross DC tie and shall certify to the Commission when it has completed these actions.	Complete (Determination approved by ERCOT Board October 8, 2019)	N/A	Complete
5. ERCOT shall study and determine how best to model the Southern Cross DC tie in its transmission planning cases, make any necessary revisions to its standards, guides, systems, and protocols as appropriate, and certify to the Commission when it has completed these actions.	Complete (Determination approved by ERCOT Board April 9, 2019)	N/A	Complete
6. ERCOT shall study and determine what transmission upgrades, if any, are necessary to manage congestion resulting from power flows over the Southern Cross DC tie, make any necessary revisions to its standards, guides, systems, and protocols as appropriate, and certify to the Commission when it has completed these actions.	In Progress	In Progress	Q4 2020
7. ERCOT shall (a) study and determine whether some or all DC ties should be economically dispatched or whether implementing a congestion-management plan or special protection scheme would more reliably and cost-effectively manage congestion caused by DC tie flows, (b) implement any necessary revisions to its protocols, guides, standards, and systems as appropriate, and (c) certify to the Commission when it has completed these actions.	Complete (Determination approved by ERCOT Board February 11, 2020)	N/A	Complete

ATTACHMENT B

Directives	Status	Anticipated Start Date*	Target Completion Date †
8. ERCOT shall (a) study and determine whether Southern Cross Transmission or any other entity scheduling flows across the Southern Cross DC tie should be required to provide or procure voltage support service or primary frequency response, or their technical equivalents, (b) implement any necessary revisions to its standards, guides, systems, and protocols, as appropriate, and (c) certify to the Commission when it has completed these actions.	Complete • Determination regarding Primary Frequency Response. In progress • Determination regarding Voltage Support.	In Progress	Q4 2020
9. ERCOT shall (a) evaluate what modifications to existing and additional ancillary services, if any, are necessary for the reliable interconnection of the Southern Cross DC tie, (b) implement any needed modifications to ancillary-services procurement, (c) recommend how the costs of such required ancillary services are to be allocated, and (d) certify to the Commission when it has completed these actions.	In Progress	In Progress	Q4 2020
10. ERCOT shall study price formation issues to determine whether, to avoid the flows over the DC ties adversely affecting price formation in the ERCOT wholesale market or otherwise causing outcomes inconsistent with a properly functioning energy market, any changes to pricing within the ERCOT market during emergencies are necessary. ERCOT shall certify to the Commission when it has completed these actions.	Complete (Determination approved by ERCOT Board October 9, 2018)	N/A	N/A

ATTACHMENT B

Directives	Status	Anticipated Start Date*	Target Completion Date †
11. ERCOT shall study and recommend appropriate responsibility for, and allocation of, the costs identified in the Commission's final order in Docket No. 45624, including costs common to the ERCOT system and special costs that are specific to the Garland line and Southern Cross DC tie, and shall identify any existing protocols that need to be modified or new protocols that need to be created, or (if appropriate) any existing Commission rules that need to be modified or new rules that need to be enacted, to appropriately address those costs.	In Progress	In Progress	TBD
12. ERCOT shall study and determine for export-related costs whether the qualified scheduling entity should be assigned costs that ordinarily would ultimately be paid by the end-use customer.	In Progress	In Progress	TBD
13. ERCOT shall periodically update the Commission regarding its progress in completing the above tasks.	In Progress	In Progress	Q2 2021
14. ERCOT shall, as soon as practicable, notify the Commission of reasonable completion dates for the above tasks and shall report any changes to those completion dates as changes become known.	In Progress	In Progress	Q2 2021